

ABSTRACT OF THE DISCLOSURE

A bottom-pinned current-in-the-plane spin-valve magnetoresistive sensor has a dual metal-oxide capping layer on the top ferromagnetic free layer. The first capping layer is formed on the free layer and is one or more oxides of zinc (Zn). The second capping layer is formed on the first capping layer and is an oxide of a metal having an affinity for oxygen greater than Zn, such as one or more oxides of Ta, Al, Hf, Zr, Y, Ti, W, Si, V, Mg, Cr, Nb, Mo and Mn.